

## CYSTINE KNOT GROWTH FACTOR MUTANTS

### Abstract of the Disclosure

Compositions and methods based on mutant Cystine Knot Growth Factors (CKGFs) comprising amino acid substitutions relative to the wild type hormone/growth factor. Mutated glycoprotein hormones, including thyroid stimulating hormone (TSH) and chorionic gonadotropin (CG) are disclosed as exemplary mutant CKGFs. Mutant TSH heterodimers and hCH heterodimers possessed modified bioactivities, including superagonist activity. Accordingly, the present invention provides methods for using mutant CKGFs, CKGF analogs, fragments, and derivatives thereof for treating or preventing diseases. Pharmaceutical and diagnostic compositions, methods of using mutant TSH heterodimers and TSH analogs with utility for treatment and prevention of metabolic and reproductive diseases are also provided.

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